UXO Pro

15 Park Avenue
Gaithersburg, VA 20877

Memorandum

From: Steve Willis
To: Wayne Miller
Date: April 10, 2019
Subject: Review of the U.S. Air Force's Evaluation Summary for Potential Additional Monitoring Wells, ST012, Former Williams Air Force Base, received April 8, 2019.

Mr. Miller:

UXO Pro and our subcontractor Dr. Lloyd Stewart have completed a review of the U.S. Air Force's evaluation of potential additional monitoring well locations for Former Williams AFB Site ST012. We are in general agreement with the proposed locations (Attachment 1) and well installation prioritization schedule (Attachment 2) and see no reason to further delay in installation of the wells, given the fact that the Enhanced Bioremediation portion of the site remedy has been implemented. If data from the new wells indicates additional characterization wells are necessary, EPA and ADEQ can propose locations for the additional wells. Specific comments on the Air Force's recommended prioritization schedule are included on the following page.

Please contact me at (480) 316-3373 or e-mail at [HYPERLINK "mailto:steve@uxopro.com" \h]if you have comments or questions regarding this memo.

Thank you,

Steve Willis, R.G.
UXO Pro, Inc.

ED_005025_00010797-00001

UXO Pro Review of the U.S. Air Force's Evaluation Summary for Potential Additional Monitoring Wells, Site ST012, Former Williams Air Force Base, Mesa, Arizona

Specific Comments:

1. Cobble Zone Location 2. The Air Force (AF) recommends this location be medium priority only if concentrations increase again at well CZ23. Benzene was reported at 97 ug/L in April 2018 prior to the start of groundwater extraction at upgradient well CZ07. Hence, it's likely that high benzene concentrations extended significantly beyond well CZ23 at that time. AF's contractor has not provided a capture zone analysis for the CZ07 pumping, so we don't know if the capture zone extends beyond CZ23. ADEQ should continue to push for a capture zone analysis, or AF should provide the regulatory agencies with the required information to complete the analysis.
2. UWBZ Locations 1 and 2. AF recommends combining locations 1 and 2 and installing a single well between the two locations. Since the wells are relatively close together combining the wells is a reasonable option, and ADEQ should concur. However, additional wells further downgradient (N-NE of Location 1) should be considered for a follow-on phase.
3. LSZ Location 1. AF recommends leaving the location as originally proposed, which is about 60-ft. further downgradient than EPA's proposed location and correlates with ADEQ's initial preferred location. ADEQ should concur with the recommendation.
4. LSZ Location 3. AF recommends moving the well outside the plume (east of boring SB18) if goal is to improve plume boundary definition. The recommended location is more in line with ADEQ's desire to characterize the plume boundary, and ADEQ should concur with the recommendation.
5. LSZ Location 6. AF proposes this location be deferred contingent on continued monitoring at LSZ52. The regulatory agencies proposed this location to better understand the occurrence of LNAPL and high dissolved COC concentrations in well LSZ46. LSZ is also a planned sulfate injection well. Well location should be installed in a subsequent phase to ensure characterization of LNAPL in this area.
6. LSZ Location 7. AF recommends moving this well further west and deferring to a subsequent phase. This location is upgradient of the main ST012 site in the area of boring SB019. Since it is upgradient of the site deferring installation to a subsequent phase of work will not impact downgradient plume migration.

Commented [DE1]: Recall that during the March 21,2019 conference call the AF reported that the march 1, 2019 sample from this well contained 24ug/L benzene, and a subsequent sample had a concentration of 47 ug/L. that should change the priority of this well to High.

Commented [DE2]: Combining these 2 wells into one as shown on the AF figure leaves considerable northern boundary extent in the UWBZ that is not defined (see dashed line to the north in the figure). This would not fulfil ADEQ objective of defining the plume.

Commented [DE3]: My thought on this is that since the plume has not shown up thus far at LSZ52, it may very well be migrating to the south. I think a well in this area should have a higher priority. Again this would meet ADEQ objective of defining the plume.

Commented [DE4]: Deferring even further to the future does not meet ADEQ objective of defining the plume.

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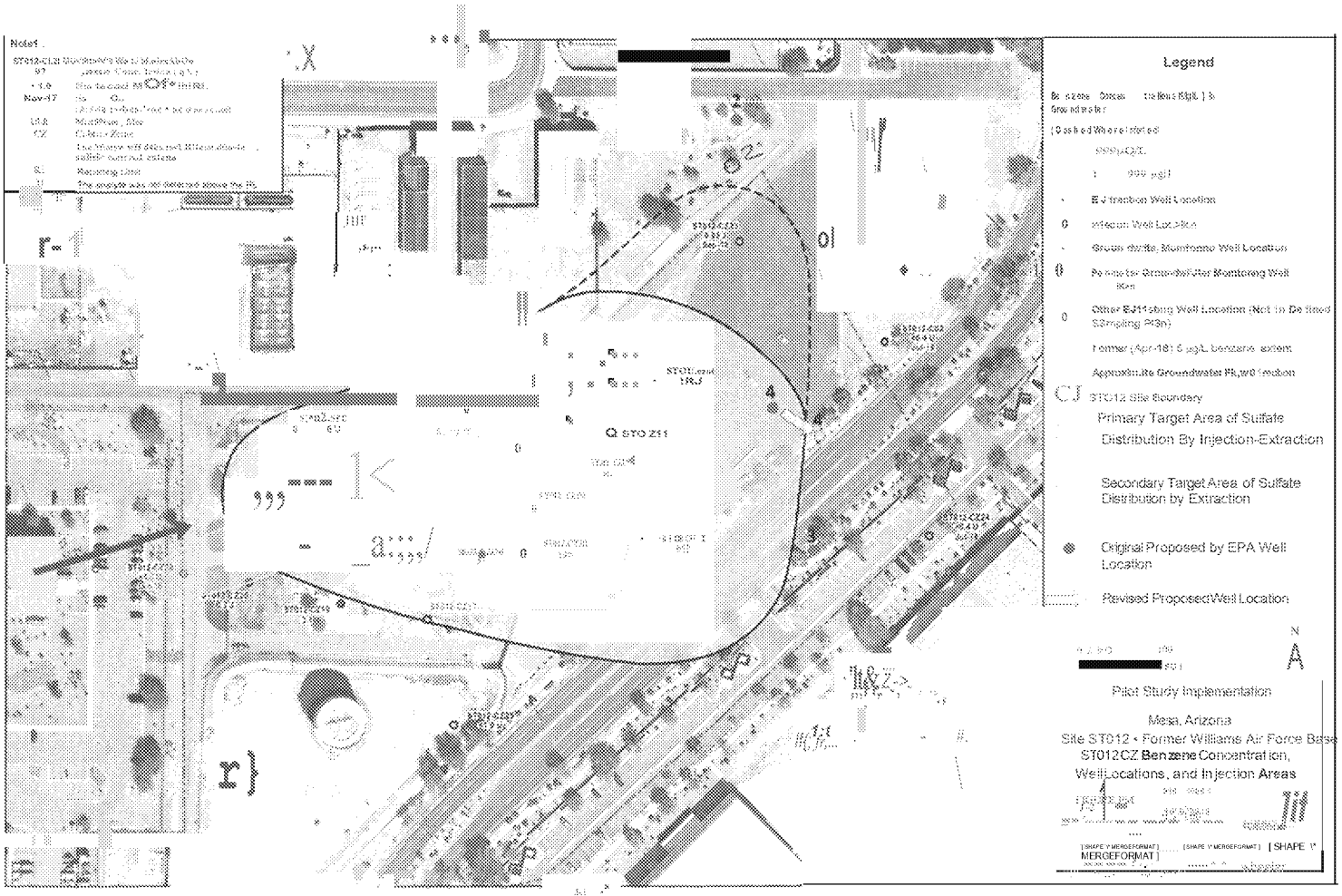
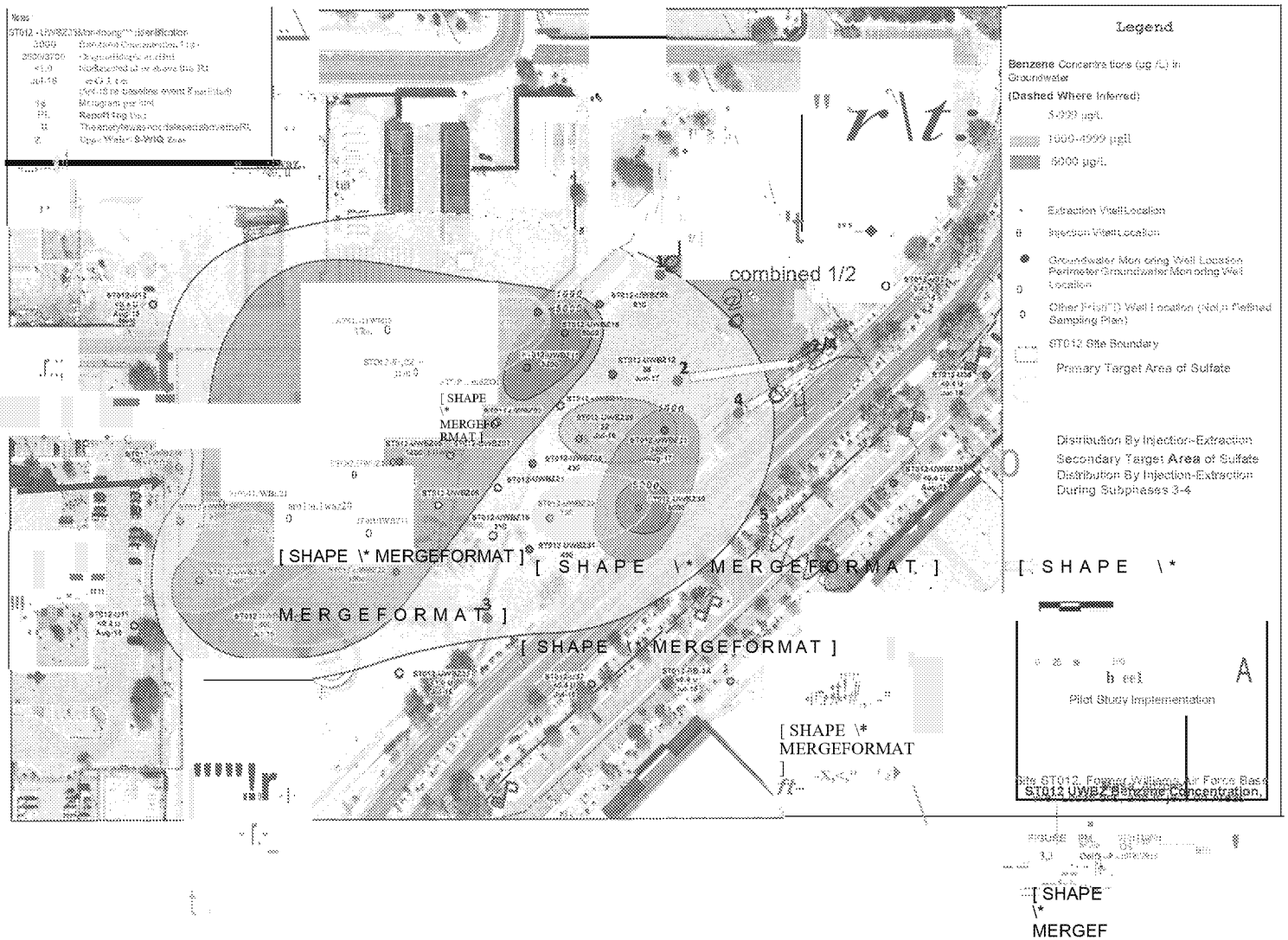
Attachment 1
Proposed Well Location Figures

ED_005025_00010797-00003


Legend
Pilot Study Implementation
Mesa, Arizona
Site ST012 - Former Williams Air Force Base
ST012CZ Benzene Concentration,
Well Locations, and Injection Areas



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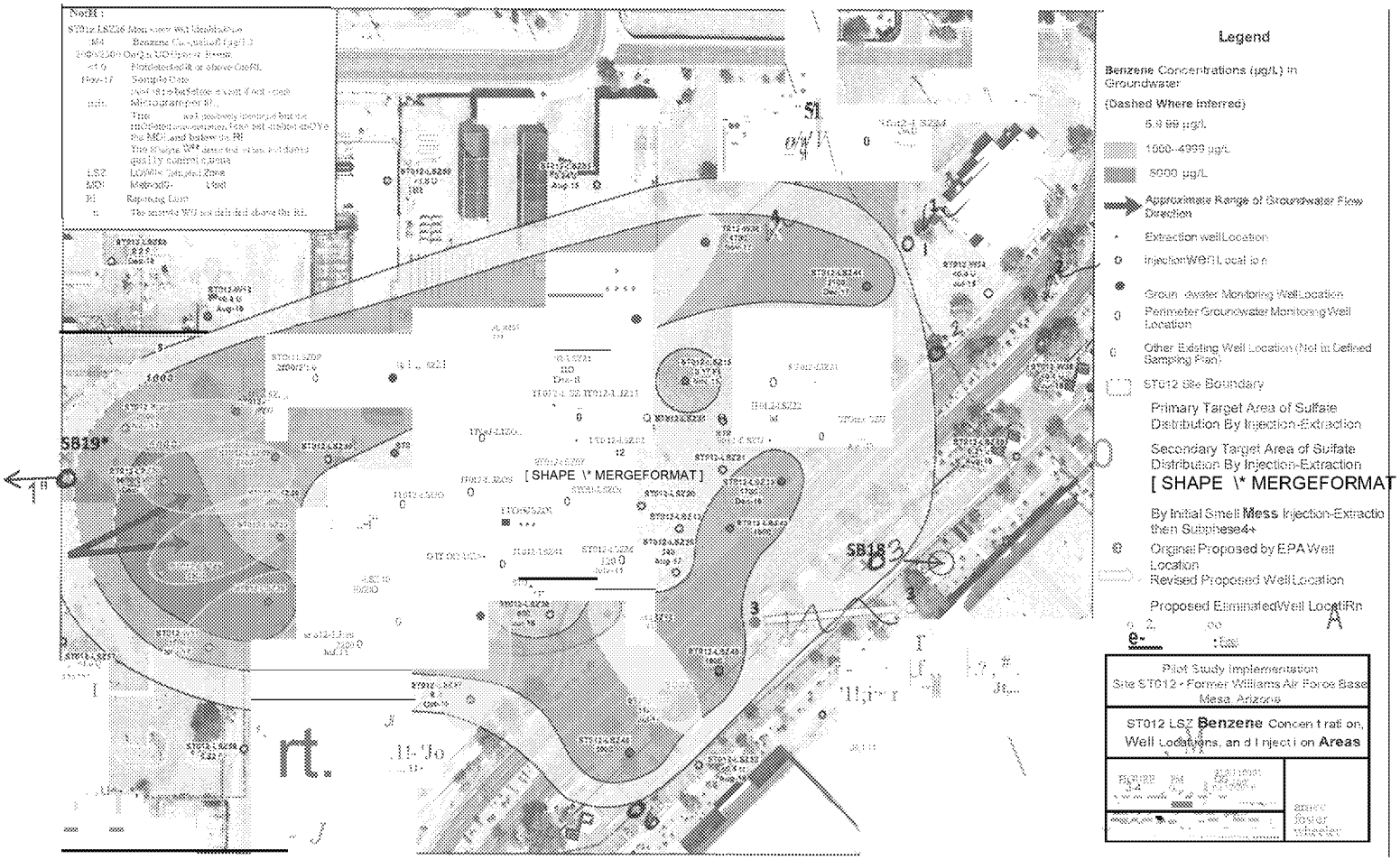
[SHAPE * MERGEFORMAT]



* Soil boring 5B19 located a pproximately 50 feet west of location shown, out of figure view

Attachment 2

Air Force Evaluation Summary for Potential Additional Monitoring Wells

ED_005025_00010797-00008

Evaluation Summary for Potential Additional Monitoring Wells

ST012, Former Williams AFB

Location Proposed by EPA	Location Description	Primary Purpose based on Call/Discussion	AFCEC Plan	EPA Priority	AFCEC Feedback
CZ Location 1	E of CZ23 See figure (ink location)	Containment monitoring beyond CZ23	Planned for initial mobilization	High	CZ Locations 1 and 2 are related to previous benzene detections at CZ23. Extraction at CZ07 was implemented and is ongoing to address the CZ23 area.
CZ Location 2	N of CZ023, see figure (ink location)	Containment monitoring beyond CZ23 and downgradient of LSZ53 area where boring had mixed results	Planned for Assessment based on CZ23 results	Medium	See feedback for CZ location 1. Relative to location 1 this location is in a cross-gradient position relative to CZ23, and as such, AF concurs location 2 is a lower priority than location 1. **Recommend this location be medium priority only if concentrations increase again at CZ23; until then, CZ23 serves to monitor containment and installation of a well at location 2 can be deferred.**
CZ Location 3	E of CZ21 (red dot)	Earlier detection of VOC or sulfate displacement from injections	Planned for initial mobilization	High	Acknowledge EPA priority. This location is a step in for perimeter monitoring to refine definition of benzene plume extent between detections at CZ41 and perimeter well CZ24.
CZ Location 4	E-SE of CZ09 (yellow dot)	Earlier detection of VOC or sulfate displacement from injections	Planned for initial mobilization	High	Acknowledge EPA priority. This location is a step in for perimeter monitoring to refine definition of benzene plume extent between plume detections at CZ41 and perimeter well C02.
UWBZ Location 1	E of UWBZ09 (red circle combined location)	Containment Monitoring beyond UWBZ09	Planned for initial mobilization combined location	High	UWBZ location 1 is in an area further northward than existing perimeter well (U02), but high concentrations at this end of the 5000-ug/L contour are constrained by relatively lower concentrations at UWBZ09. This location is biased north of the flow path from the center of the 5000 ug/L contour; **AF recommends combining locations 1 and 2 between the two handwritten locations.**
UWBZ Location 2	E -NE of UWBZ12 (red circle combined location)	Earlier detection of VOC or sulfate displacement from injections	Recommend eliminating	Medium	Concur this is location as shown is lower priority as it is further from high concentration detections. However**, AF recommends combining locations 1 and 2 to a single location** as described in feedback for location 1.
UWBZ Location 3	NE of UWBZ32	Earlier detection of VOC or sulfate displacement from injections	Planned for Assessment based on EBR monitoring	Lower	Concur this location is lower priority.
UWBZ Location 4	E of UWBZ21 (ink location)	Earlier detection of VOC or sulfate displacement from injections	Planned for initial mobilization	High	Acknowledge EPA priority. This location is a step in for perimeter monitoring to refine definition of benzene plume extent between detections at UWBZ21 and perimeter wells U02 and U38.

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Location Proposed by EPA	Location Description	Primary Purpose based on Call/Discussion	AFCEC Plan	EPA Priority	AFCEC Feedback
UWBZ Location 5	E of UWBZ30 (red dot)	Containment Monitoring beyond UWBZ30	Planned for initial mobilization	High	Acknowledge EPA priority. This location is a step in for perimeter monitoring to refine definition of benzene plume extent between detections at UWBZ30 and perimeter wells UWBZ38.
LSZ Location 1 (original red dot)	NE of LSZ44	Containment monitoring in gap between W34 and LSZ54 (Moved closer to 5 ppb line per ADEQ)	Planned for initial mobilization	High	Concur this is one of the highest priority locations. **AF prefers location as originally proposed** if goal is to define plume boundary; the 5 ug/L contour can reasonably be interpreted to be further east as it passes LSZ44, so there is risk of seeing significant detections at the ink location.
LSZ Location 2	E of LSZ29	Plume displacement, containment monitoring	Will be considered for second mobilization	Medium	Acknowledge EPA priority. This location is a step in for perimeter monitoring to refine definition of the benzene plume margin between plume detections and three existing perimeter wells.
LSZ Location 3	Between W24 and LSZ55 (red circle)	Earlier detection of VOC or sulfate displacement from injections	Planned for initial mobilization	High	**AF prefers moving well outside the plume (east of SB18) if goal is to improve plume boundary definition**. Co-location with SB18 is expected to be within the plume. Note: revised locations are no longer co-located with UBWZ location 5.
LSZ Location 4	NE of W36 (ink location)	Earlier detection of VOC or sulfate displacement from injections	Planned for initial mobilization	High	Acknowledge EPA priority. This location is a step in for perimeter monitoring to refine definition of benzene plume extent between detections at W36 and perimeter well LSZ54.
LSZ Location 5	NE of W36	Combined with location 4	LSZ Location 4 now addresses this area	Eliminate	AF concurs with eliminating location 5 given current proposed location 4.
LSZ Location 6	S of LSZ46	discussed on call to address potential characterization gap	Planned for Assessment based on LSZ52 results	Lower	**AF proposes this location be deferred contingent on continued monitoring at LSZ52.**
LSZ Location 7	W of W30 and SB19	discussed on call to address potential characterization in area of SB19	Will be considered for second mobilization	Medium	**AF prefers location 7 be moved west** 50 – 100 to be near SB19 if objective is to define extent.

Notes:

Initial mobilization to address high priority locations. Medium and lower priorities will be revisited at a later date to confirm locations considering available monitoring data. Locations and priority will continue to be evaluated as additional site data is received.

Yellow highlight – 9 wells recommended for inclusion in first well installation mobilization. Grey highlight – 2 wells proposed for elimination.

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